ABSTRACT OF THE DISCLOSURE:

A membrane artificial lung performs ~~for performing~~ gas exchange between blood and a gas via the membrane by flowing the blood in one side of the membrane and flowing oxygen or an oxygen-containing gas in the other side of the membrane. ~~wherein said membrane comprises~~ The membrane has a hollow fiber membrane of ~~, said hollow fiber membrane comprising~~ poly-4-methylpentene-1 and ~~having~~ an oxygen permeation rate $Q(O_2)$ at 25°C of from 1×10^{-6} to 3×10^{-3} $(cm^3(STP)/cm^2 \cdot sec \cdot cmHg)$ and an ethanol flux of from 0.1 to 100 $ml/min \cdot m^2$. The ~~wherein said~~ membrane has, in the side of the blood flow, a surface having ~~comprising~~ an ionic complex derived from: quaternary aliphatic alkylammonium salts; and heparin or a heparin derivative. ~~, and wherein said~~ The quaternary alkylammonium salts are ~~comprise~~ a quaternary aliphatic alkylammonium salt having from 22 to 26 carbon atoms in total and a quaternary aliphatic alkylammonium salt having from 37 to 40 carbon atoms in total.